

CL2360USNA.ST25
SEQUENCE LISTING

<110> E.I. duPont de Nemours and Company, Inc.
Cheng, Qiong
Tao, Luan

<120> GENES ENCODING CAROTENOID COMPOUNDS

<130> CL2360 US NA

<150> US 60/471,904

<151> 2003-05-20

<150> US 60/527,083

<151> 2003-12-03

<160> 20

<170> PatentIn version 3.2

<210> 1

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<212> DNA

<213> Enterobacteriaceae strain DC260

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20 25 30

Gly Gln Gln Ser Asp Arg Val Arg Ala Ala Met Arg Ala Gly Thr Leu
35 40 45

Ala Gln Gly Lys Arg Ile Arg Pro Leu Leu Leu Leu Leu Ala Ala Arg
50 55 60

Asp Met Gly Cys Glu Leu Thr Gln Asn Gly Val Leu Asp Leu Ala Cys
65 70 75 80

Ala Val Glu Met Val His Ala Ala Ser Leu Ile Leu Asp Asp Ile Pro
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Ser Met Asp Asn Ala Gln Met Arg Arg Gly Arg Pro Thr Val His Arg
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Glu Phe Gly Glu Asn Val Ala Ile Leu Ala Ala Ile Ala Leu Leu Ser
115 120 125

Arg Ala Phe Glu Val Ile Ala Ile Ala Pro Gly Leu Pro Ala Ile His
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Lys Ser Glu Ala Ile Ala Glu Leu Ser Ala Ala Val Gly Leu Gln Gly
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Leu Val Gln Gly Gln Phe Gln Asp Leu His Asp Gly Thr Gln Ser Arg
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Ser Pro Glu Ala Ile Ala Met Thr Asn Glu Leu Lys Thr Ser Val Leu
180 185 190

Phe Arg Ala Thr Leu Gln Met Ala Ala Ile Ala Ala Asp Ala Ser Pro
195 200 205

Gln Val Arg Gln Arg Leu Ser Phe Phe Ala Gln Asp Leu Gly Gln Ala
210 215 220

Phe Gln Leu Leu Asp Asp Leu Ala Asp Gly Cys Lys His Thr Gly Lys
225 230 235 240

Asp Val His Gln Asp Gln Gly Lys Ser Thr Leu Val Gln Met Leu Gly
245 250 255

Ala Asp Gly Ala Glu Arg Arg Leu Arg Asp His Leu Arg Ser Ala Asp
260 265 270

Ala His Leu Ala Cys Ala Cys His Arg Gly Ile Ala Thr Arg Gln Tyr
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285

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<213> Enterobacteriaceae strain DC260

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<213> Enterobacteriaceae strain DC260

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 Thr Phe Ile Gln Gln Ala Asp Ala Arg Thr Leu Leu Ser Asp Glu Arg
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 Ile Asp Phe Val Ala Val Gly Gln Gln Thr His Pro Ala Gly Ser Leu
 50 55 60
 Ala Pro Val Leu His Arg Leu Ala Ser Pro Gly Gly Leu Ser Leu Phe
 65 70 75 80
 Arg Val Ile Asp Asp Leu Ala Ser Cys Thr Asp Met Leu Cys Arg Glu
 85 90 95
 Leu Pro Ala Val Leu Lys Ala Leu Asn Ile Asp Gly Val Ile Ala Asp
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 Glu Met Glu Ala Ala Gly Gly Leu Val Ala Glu Ala Leu His Leu Pro
 115 120 125
 Phe Val Ser Val Ala Cys Ala Leu Pro Val Asn Arg Glu Ala Gly Ile
 130 135 140
 Pro Leu Ala Val Met Pro Phe Arg Phe Ala Gln Asp Asp Lys Ala Leu
 145 150 155 160
 Lys Arg Phe Gln Ala Ser Ser Asp Ile Tyr Asp Arg Ile Met Arg Arg
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 Arg Arg Gly Leu His Gln Cys Leu Ser Pro Leu Ala Gln Ile Ser Gln
 195 200 205
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 210 215 220
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 260 265 270
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Ile Thr His Ala Gly Leu Asn Ser Ala Leu Glu Ala Leu Glu Cys Gly
325 330 335

Thr Pro Met Leu Ala Leu Pro Ile Ala Phe Asp Gln Pro Gly Val Ala
340 345 350

Ala Arg Ile Glu Trp His Asp Val Gly Arg Arg Ala Ser Arg Phe Ser
355 360 365

Arg Val His Gln Leu Glu Gln His Leu Gln Gln Leu Leu Thr Asp Asp
370 375 380

Arg Tyr Ala Leu Arg Met Ser Ala Ile Gln Ala Gln Leu Gln Arg Ala
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          20           25           30

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Leu Leu Leu Glu Ser Asp Ala His Pro Ala Gly Asn His Thr Trp Ser
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Phe His His Ser Asp Leu Ser Ala Glu Gln Leu Arg Trp Leu Gln Pro
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Arg Arg Asn Leu Asp Gly Asp Tyr Cys Ser Ile Ala Ser Gly Asp Phe
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Ala Arg His Leu Tyr Ala Ala Met Gly Asp Asp Leu Trp Thr Asn Thr
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Ala Val Gln Gln Val Lys Pro Thr Gln Val Thr Leu Ala Asp Gly Arg
          115           120           125

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Glu Leu Ala Ala Gln Val Val Ile Asp Gly Arg Gly Leu Gln Pro Thr
          130           135           140

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Pro His Leu Gln Leu Gly Tyr Gln Val Phe Leu Gly Gln Glu Trp Gln
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Leu Ala Gln Pro His Gly Leu Gln Gln Pro Ile Leu Met Asp Ala Thr
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Val Asp Gln Gln Ala Gly Tyr Arg Phe Val Tyr Thr Leu Pro Leu Ser

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185

190

Ala Asp Arg Leu Leu Ile Glu Asp Thr His Tyr Val Asn Gln Pro Ala
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 210 215 220

Gln Gly Trp Thr Leu Ser Thr Leu Leu Arg Glu Glu His Gly Ile Leu
 225 230 235 240

Pro Ile Thr Leu Ser Gly Asn Ile Asp Arg Phe Trp Gln Gln Gln Arg
 245 250 255

Gly Gln Ala Cys Ser Gly Leu Arg Ala Gly Leu Phe His Ala Thr Thr
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Gly Tyr Ser Leu Pro Ser Ala Val Ala Leu Ala Glu Leu Val Ala Ala
 275 280 285

Leu Leu Pro Thr Asp Ala Leu Thr Leu Ser Gln His Ile Glu Arg Phe
 290 295 300

Ala Arg Gln Gln Trp Arg Glu Gln Arg Phe Phe Arg Leu Leu Asn Arg
 305 310 315 320

Met Leu Phe Leu Ala Gly Lys Pro Gln Gln Arg Trp Arg Val Met Gln
 325 330 335

Arg Phe Tyr Arg Leu Asp Ala Gly Leu Ile Ser Arg Phe Tyr Ala Gly
 340 345 350

Gln Leu Arg Leu Arg Asp Lys Thr Arg Ile Leu Cys Gly Lys Pro Pro
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20           25           30
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Arg Asp Lys Pro Gly Gly Arg Ala Tyr Val Phe Glu Asp Ser Gly Phe
35           40           45
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```
Thr Phe Asp Ala Gly Pro Thr Val Ile Thr Asp Pro Ser Ala Ile Glu
50           55           60
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Glu Leu Phe Thr Leu Ala Gly Lys Ser Leu Ser Asp Tyr Val Glu Leu
Page 8
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80

Met Pro Val Thr Pro Phe Tyr Arg Leu Cys Trp Glu Asp Gly Lys Gln
85 90 95

Leu Asp Tyr Asp Asn Asn Gln Pro Leu Leu Glu Gln Gln Ile Ala Thr
100 105 110

Phe Asn Pro Gln Asp Val Glu Gly Tyr Arg Gln Phe Leu Ala Tyr Ser
115 120 125

Arg Glu Val Phe Arg Glu Gly Tyr Leu Lys Leu Gly Thr Val Pro Phe
130 135 140

Leu Gln Val Arg Asp Met Leu Arg Val Ala Pro Gln Leu Gly Arg Leu
145 150 155 160

Gln Ala Trp Arg Ser Val Tyr Ser Met Val Ala Lys Phe Ile Gln Asp
165 170 175

Asp His Leu Arg Gln Ala Phe Ser Phe His Ser Leu Leu Val Gly Gly
180 185 190

Asn Pro Phe Ala Thr Ser Ser Ile Tyr Thr Leu Ile His Ala Leu Glu
195 200 205

Arg Glu Trp Gly Val Trp Phe Pro Arg Gly Gly Thr Gly Ala Leu Val
210 215 220

Gln Gly Met Ala Arg Leu Phe Glu Asp Leu Gly Gly Glu Leu Leu Leu
225 230 235 240

Asn Ala Glu Val Ser Gln Leu Glu Thr Ser Gly Asn Arg Ile Ser Gly
245 250 255

Val Gln Leu Glu Gly Gly Arg Arg Phe Asp Ala Ala Ala Val Ala Ser
260 265 270

Asn Ala Asp Val Val His Thr Tyr Asp Lys Leu Leu Arg His His Pro
275 280 285

Leu Ala Met Lys Arg Ala Thr Ser Leu Lys Arg Lys Arg Met Ser Asn
290 295 300

Ser Leu Phe Val Leu Tyr Phe Gly Leu Asn Gln Pro His Glu Gln Leu
305 310 315 320

Ala His His Thr Val Cys Phe Gly Pro Arg Tyr Arg Glu Leu Ile Asp
325 330 335

Glu Ile Phe Asn Ser Ser Gln Leu Ala Asp Asp Phe Ser Leu Tyr Leu

340

345

350

His Ala Pro Cys Ser Ser Asp Pro Ser Leu Ala Pro Pro Gly Cys Gly
 355 360 365

Ser Phe Tyr Val Leu Ala Pro Val Pro His Leu Gly Thr Ala Asp Ile
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Asp Trp Gln Gln Glu Gly Pro Arg Leu Arg Asp Arg Ile Phe Ala Tyr
 385 390 395 400

Leu Glu Gln His Tyr Met Pro Gly Leu Arg Gln Gln Leu Val Thr His
 405 410 415

Arg Met Phe Thr Pro Phe Asp Phe Arg Asp Thr Leu His Ala His His
 420 425 430

Gly Ser Ala Phe Ser Leu Glu Pro Ile Leu Thr Gln Ser Ala Trp Phe
 435 440 445

Arg Pro His Asn Arg Asp Ala Asp Ile Ser Asn Leu Tyr Leu Val Gly
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20 25 30

Arg Arg Ser Thr Leu Met Leu Tyr Ala Trp Cys Arg His Cys Asp Asp
35 40 45

Val Ile Asp Gly Gln Thr Leu Gly Glu Gly Gly Thr Gln His Ala Val
50 55 60

Glu Asp Ala Gln Ala Arg Met Gln His Leu Gln Ile Glu Thr Arg Arg
65 70 75 80

Ala Tyr Ser Gly Ala His Met Asp Glu Pro Ala Phe Arg Ala Phe Gln
85 90 95

Glu Val Ala Ile Ile His Gln Leu Pro Gln Gln Leu Ala Phe Asp His
100 105 110

Leu Glu Gly Phe Ala Met Asp Ala Arg Asn Glu His Tyr Ala Ser Phe
115 120 125

Asp Asp Thr Leu Arg Tyr Cys Tyr His Val Ala Gly Val Val Gly Leu
130 135 140

Met Met Ala Arg Val Met Gly Val Arg Asp Glu Ala Val Leu Asp His
145 150 155 160

Ala Cys Asp Leu Gly Leu Ala Phe Gln Leu Thr Asn Ile Ala Arg Asp
165 170 175

Ile Val Glu Asp Ala Glu Asn Gly Arg Cys Tyr Leu Pro Gln Ser Trp
180 185 190

Leu Asp Gln Ala Gly Leu Arg Ala Asp Thr Leu Thr Ala Pro Gln His
195 200 205

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Arg Ala Ala Leu Ala Ser Leu Ala Ala Arg Leu Val Ala Glu Ala Glu
210 215 220

Pro Tyr Tyr His Ser Ala Arg Ser Gly Leu Pro Gly Leu Pro Leu Arg
225 230 235 240

Ser Ala Trp Ala Ile Ala Thr Ala Arg Gly Val Tyr Arg Glu Ile Gly
245 250 255

Val Lys Val Gln His Ala Gly Val His Ala Trp Asp Ser Arg Gln Arg
260 265 270

Thr Ser Lys Gly Glu Lys Leu Ala Leu Leu Val Lys Gly Ala Gly Leu
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Trp Gln Arg Pro Arg
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Ala Gly Met Thr Thr Tyr Gly Ala Leu Tyr Phe Met Val His Asp Gly
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Arg Glu Gly Cys Val Ser Phe Gly Phe Leu Tyr Ala Pro Pro Leu Asn
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<213> Enterobacteriaceae strain DC260

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